

SPACE OPERATIONS SYMPOSIUM (B6)
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A INTELLIGENT SCHEDULE METHOD FOR CHINESE TT&C NETWORK

Abstract

Nowadays China has above 100 satellites in orbit, which requests more satellite-ground accesses for TTC (Tracking Telemetry and Command) compared with that of ten years ago. To satisfy the increasing need of communication access, China has set up a large-scaled ground network around globe and a space network consisted of three TDRSS(Tracking and Data Relay Satellite System). Scheduling access requests is referred to as the Satellite Range Scheduling Problem (SRSP). Traditional schedule method used by Chinese TTC network is mainly facing two problems, the human schedulers' heavy workload and unacceptable request conflict rate. A more intelligent schedule method is in need for Chinese TTC network. This paper presents an overview of three key issues: 1) how has the problem changed over the last 10 years, 2) what algorithms work best and 3) what objective function is appropriate. Firstly ,we describe the Chinese TTc application and some of the changes that we have identified in the application based on the data we have collected and based on conversations with human schedulers. We also show how the change in objective function impacts the performance of the solutions. We compared data sets and found significant differences in the problems. Our evaluation of solutions focus on three algorithms: FIFO algorithm, synthesized priority level algorithm, and genetic algorithm. It can be shown that genetic algorithm has advantages over other two algorithms.